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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/705,249 | 11/10/2003 | Warren M. Farnworth | 2269-5558J US (99-0253.09) | 3194 |
| 24247 | 7590 | 12/13/2006 | EXAMINER | |
| TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110 | | | EWALD, MARIA VERONICA | |
| | | | ART UNIT | PAPER NUMBER |

1722

DATE MAILED: 12/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/705,249

Applicant(s)

FARNWORTH, WARREN M.

Examiner

Maria Veronica D. Ewald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 – 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Leyden, et al. (U.S. 5,143,663). Leyden, et al. teach a stereolithography apparatus, comprising: a fabrication chamber in which a volume of liquid material is contained (item 100 – figures 4c and 4d; column 20, lines 34 – 50); and a bubble elimination system associated with the fabrication chamber and configured to facilitate removal of gas bubbles from the volume of liquid material (column 22, lines 23- 40; column 23, lines 20 – 30); wherein the bubble removal elimination system causes the liquid material to vibrate (column 22, lines 23 – 27); wherein the bubble elimination system is associated with a wall of the fabrication chamber (item 110 – figure 4c; column 22, lines 25 – 30).

With respect to claims 4 – 7, Leyden, et al. further teach that the bubble elimination system is associated with a structure located at least partially within the fabrication chamber (column 22, lines 25 – 30); wherein the structure located at least partially within the fabrication chamber comprises a fabrication support (column 21, lines 15 – 35; column 22, lines 25 – 40); wherein the bubble elimination system comprises an ultrasonic transducer (item 110 – figure 4c; column 22, lines 25 – 27);

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wherein the ultrasonic transducer comprises a piezoelectric transducer (item 110 – figure 4c; column 11, lines 25 – 30; column 12, lines 60 – 68).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 – 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leyden, et al. in view of Takahashi (U.S. 5,610,683), Whalen, et al. (U.S. 5,824,250), or Iwashita, et al. (U.S. 6,190,008). Leyden, et al. teach the characteristics previously described but do not teach that there is a negative pressure source for applying a negative pressure to a surface of the volume of liquid material and wherein the negative pressure source is configured to apply negative pressure sufficient for removing gas bubbles at or near the surface.

In a method to remove bubbles from a lithography apparatus in which semiconductors are manufactured, Takahashi teaches the use of an ultrasonic vibration device to homogenize the immersion liquid in which the semiconductor is placed, which also prevents adhesion of bubbles and thus, eliminates bubbles from the surface of the wafer. To remove the bubbles from the liquid, a vacuum pump is used to provide negative pressure.

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Similarly, in a method to remove bubbles from a ceramic slurry poured into gel-cast mold, manufactured via stereolithography, Whalen, et al. teach the use of vibration (via an ultrasonic bath) or vacuum de-airing. If the vacuum de-airing is used, a negative pressure is provided on the slurry.

Furthermore, in methods to eliminate or remove bubbles from an ink reservoir used for an inkjet head, Iwashita, et al. teach the use of a suction device which applies negative pressure to the ink reservoir which eliminates bubbles from the ink supply.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Leyden, et al. to include a negative pressure source – either a vacuum source or suction on the surface of the ultrasonic bath to eliminate the formed bubbles from the liquid.

Response to Arguments

15. Applicant's arguments filed October 2, 2006, with respect to claim 1 and the reference of Leyden, et al. have been fully considered but they are not persuasive. Applicant has argued that the ultrasonic bath of Leyden, et al. cannot remove bubbles from the object being manufactured in the build chamber; however, Examiner disagrees. *Inherently, an ultrasonic bath operates to induce vibrations within a solution, which dislodge contaminants from the object, and also dislodges bubbles adhering to the surface of the object, which then either expand and pop or float to the surface of the solution.* Thus, the ultrasonic bath of Leyden, et al. *is configured to remove bubbles.*

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Furthermore, though Applicant has argued that the bath of Leyden, et al. is not configured to remove bubbles, Applicant has not identified *either in the specification or in the arguments set forth what distinguishing structural features of Applicant's ultrasonic bath differ over the prior art.* In paragraph 0074 of Applicant's specification, it states that "bubble elimination system 165' may comprise an ultrasonic transducer of known type...which causes fabrication tank...thereof to vibrate. Vibrations...are transmitted to unconsolidated material within reservoir 120', causing any bubbles therein to dislodge from a structure to which they are adhered and float to surface..." Thus, Applicant has identified that an *ultrasonic transducer of known type is used.* There is no other special feature of the ultrasonic transducer identified in Applicant's specification which differs from that of Leyden, et al. and thus, the apparatus of Leyden, et al. anticipates claim 1.

With respect to the rejection of claims 8 – 9, Examiner agrees with Applicant's arguments that Leyden, et al. do not anticipate such claims. Thus, Examiner has cited the references of Takahashi (U.S. 5,610,683), Whalen, et al. (U.S. 5,824,250), and Iwashita, et al. (U.S. 6,190,008). Each reference cites the elimination of bubbles from a solution via the application of negative pressure, either through suction or a vacuum pump. Furthermore, the reference of Takahashi also states that *an ultrasonic transducer is used to eliminate bubbles from the surface of a wafer used in semiconductor manufacture, of which, the bubbles can be eliminated from the immersion solution using a vacuum pump.*

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With respect to the rejection of claim 1 over Hirano, Examiner agrees that Hirano does not teach *a system to eliminate bubbles*. Hirano teaches that a fabrication stage is moved as close as possible to the base of a chamber to force bubbles from the gap formed between the two structures. Thus, the rejection over Hirano has been withdrawn.

Conclusion

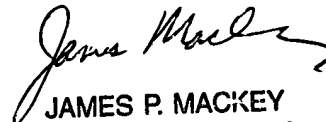
16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MVE


JAMES P. MACKEY
PRIMARY EXAMINER

12/11/06